

METHOD AND APPARATUS FOR CONTINUOUS SEPARATION
AND REACTION USING SUPERCRITICAL FLUID

Abstract of the Disclosure

A method for the continuous process of fluids is based on mixing the fluid with a
5 supercritical fluid. The mixing of the two fluids may be accomplished using either a co-
flow or counter-flow process. The process focuses on the difference in the solubilities of
the desired and the undesired components into supercritical fluid and de-emphasizes the
influence of the contaminating components of the fluid to be processed. The process of
the present invention is particularly advantageous to the recycling of industrial waste
10 fluids, such as used oil, wherein the process is carried out by jet spray micro-orifices
atomization of waste material with a supercritical fluid to dissolve oil from the waste
material. Additional mixing devices such as a magneto driven impeller shaft and
ultrasonic gun may be employed. Thereafter, un-dissolved components are separated, first
and the dissolved fluid is then separated from the supercritical fluid. Various apparatus for
15 carrying out the method are also disclosed.